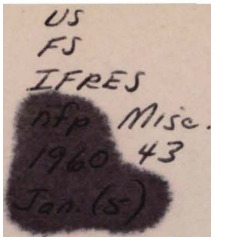

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INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION
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FOREST SERVICE, U. S. DEPARTMENT OF AGRICULTURE

Ogden, Utah January, 1960

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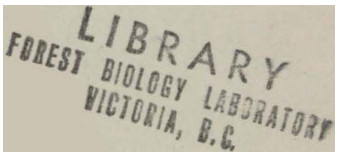
Archibald Tunnock, Jr., Entomologist



Prepared By The
Missoula Forest Insect Laboratory
Missoula, Montana

EVALUATION OF ENGELMANN SPRUCE BEETLE INFESTATIONS ON THE KOOTENAI NATIONAL FOREST, MONTANA 1959

Archibald Tunnock, Jr., Entomologist
Division of Forest Insect Research

Localized outbreaks, or "hot spots", of the Engelmann spruce beetle, Dendroctonus engelmanni Hopk., still persist in some drainages on the Kootenai National Forest. These outbreaks are remnants of the widespread infestation that developed on this and other national, State, and private forests in eastern Washington, northern Idaho, and western Montana in July 1952. Logging has been practiced to control the beetle infestations on the Forest since 1953 but, despite this action, some beetle infestations have continued, usually where a fair residual volume of spruce type remains.

In August 1958, personnel of the Missoula Forest Insect Laboratory made a biological evaluation of spruce beetle infestations in the Fortine, Rexford, and Yaak Ranger Districts of the Kootenai. Evaluations were concentrated in drainages suspected of having the most damaging infestations during 1958. Their purpose was to determine if beetle attacks had increased or decreased since 1958 and to assess the results of logging as a means of beetle control.

METHODS

The 1959 evaluation employed meandering strips one-half chain wide to survey the residual spruce stands. All unattacked and currently attacked spruce trees above 9 inches in diameter were recorded by units of 100 trees along each strip. Separate counts were kept of the partially attacked trees, fully attacked trees, and trees that had pitched out and successfully repelled the beetle's attacks.

During a 1957 survey, Pinkham Creek drainage, Rexford District, was divided into blocks to determine the variability of the infestation between different parts of the drainage. These blocks were treated as entities again in 1959.

RESULTS

The 1959 evaluation enabled a comparison to be made between the number of spruce trees infested by the beetle in 1958 and the number infested during 1959 within the drainages under study (table 1). The number of infested trees in 1959 increased 49 per cent over the corresponding number in 1958 in the Wigwam Creek drainage. This drainage contained the only increasing infestation of all infestations evaluated in 1958 or 1959. Although the average percentage of trees infested in the residual spruce stands of Wigwam Creek is 8.4, there are some small areas where 40 percent of the trees were infested in 1959. These areas are located along the bottom of the drainage.

Table 1 also indicates that the spruce beetle epidemic is at a very low level over most of the Kootenai National Forest. Logging has probably been the most important factor in reducing localized outbreaks. Control appears to be most effective when infested stands are clear-cut and the logging debris is exposed to the sun or burned before the emergence of beetle broods bred in it. In this way the killing of residual spruce trees or of trees in adjacent uncut stands appears to be prevented or held to an acceptable level.

The low level of tree mortality in almost all the drainages sampled, coupled with apparent declining infestations in 1959, gives some assurance that the Engelmann spruce beetle infestations have already reached endemic levels or will so in 1960. The more serious infestation found in the Wigwam Creek drainage should be reduced in severity in 1960 because of the logging of infested trees carried out in 1959.

Table 1.--Abundance of trees infested by the Engelmann spruce beetle within residual stands in logged drainages on the Kootenai National Forest, 1959

Drainage	Engelmann spruce trees sampled							
	Number of uninfested trees	Number of trees with pitched-out attacks	Number of beetle-infested trees: partially attacked	Number of beetle-infested trees: completely attacked	Total number of trees examined	Percentage of trees infested in stand: 1958	Percentage of trees infested in stand: 1959	Percentage of increase or decrease in infestation from 1958 to 1959
REXFORD DISTRICT								
Pinkham Creek								
Block A	493	1	2	4	500	1.3	1.2	- 7.7
Block B	500				500	.4	0	-100.0
Block C	599			1	600	.6	.1	- 83.3
Block D	599	1			600	.7	0	-100.0
Block E	499	1			500	1.0	0	-100.0
TOTALS	2690	3	2	5	2700			
AVERAGE						.8	.3	-62.5
FORTINE DISTRICT								
Wigwam Creek	2358	19	28	189	2594	4.3	8.4	+ 48.8
Foundation Creek	499		1		500	7.5	.2	- 97.3
TOTALS	2857	19	29	189	3094			
AVERAGE						4.8	7.0	+ 45.8
YAAK DISTRICT								
Caribou Creek	400				400	3.7	0	-100.0
Red Top Creek	240				240	1.2	0	-100.0
Davis Creek	946	1	1	2	950	2.2	.3	- 86.4
TOTALS	1586	1	1	2	1590			
AVERAGE						2.5	.2	- 92.0